REMARKS

Reconsideration and allowance of the instant application are respectfully requested. Claims 1-7, 9-15, 17, and 19-20 are pending. Claims 1-5, 10, and 17 are amended. Claims 8, 16, and 18 are canceled.

Claim 1 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Rogers (U.S. Patent No. 2,665,409) in view of Satake (U.S. Patent No. 4,403,191) and Joshi.

Claim 1, as amended, is directed to a method for determining the moisture content of a quantity of soil comprising:

-determining the volume of the quantity of soil,

-determining the weight of the quantity of soil,

-determining the specific density from the volume and the weight, and

-finally determining the moisture content by comparing the specific density with a table containing moisture content and specific density information for the soil.

Rogers discloses determining the moisture in grain (column 4, line 52), grits, meals, flours, and the like (column 2, lines 20-27). Rogers does not teach or suggest determining moisture in soil. Soil is a compressible/flexible material whereas grain, grits, meals, and flour are not. These different characteristics do not lead one skilled in the art to simply substitute the grains in Rogers for the soil and expect a comparable result.

In the Advisory Action, it is asserted that grits etc. can be a growing medium since fungus can grow on such material. Although applicant does not agree that grits etc. are considered a growing medium as defined in the instant specification, claim 1 has been amended to recite soil. Grain, grits, meals, and flour are not soil and Rogers teaches no equivalence thereof.

Moreover, Rogers discloses a method for *continuously* determining the moisture in a *flow* of the material. In contrast, claim 1 is directed to determining the moisture of a quantity of soil. A quantity is a given amount, e.g. a bucket of soil, (also referred to in the art as a batch.) The volume of the quantity is determined. The weight of the quantity is determined. The moisture

content is determined from the volume and the weight. Contrary to the position in the Advisory Action, the method of claim 1 could not work if there was a continuous stream of material. Claim 1 requires measurement of a quantity of material.

In Rogers, there is a free fall or stream of material and the moisture is determined by electrostatic measurements in the stream of material. Attention is drawn to column 2, lines 31-45. The material which is being tested is *in motion* and the moisture measurement is taken while the material is *in motion*. This continuous method is distinguished over batch methods. See column 2, lines 41-45. The constant volume refers to the flow of the stream of material under a constant head of pressure. It does not refer to a separate quantity of material that is measured for volume and weight. Rogers recognizes no relationship between weight, volume, and moisture, especially moisture of soil.

Column 4, lines 53-55, describes a counterbalancing weight. The counterweight used on a platform in Rogers. When there is a flow of material, the platform (6) tilts against stop (8) so that the material falls off the platform. When there is no flow of material, the counterbalance (7) raises the platform (6) into a horizontal position. This in turn sends a message to the electrostatic measuring device to cut off measuring. The weight of the material is not being measured.

The steps of measuring out a constant volume of material under a head of pressure and the method of stopping the electrostatic measurement using a counterbalancing weight on a platform are *independent* of each other. There is *no connection* between the volume and the counterbalancing weight that would provide values to determine moisture content of the material.

In sum, Rogers provides a certain volume under a head of pressure to provide a continuous flow of material and measures the moisture content using electrostatic means while the material is in motion. Rogers does not take a quantity of material and measure its volume and measure its weight and use the measured volume and weight to determine the moisture content. In contrast, the process of the instant claims requires measurement of, and a relationship between, volume and weight to determine the specific density, and then the moisture content.

Satake, like Rogers, is not directed to measuring moisture in soil. Similar to Rogers,

Satake relies on *electrostatic* measurements to determine moisture content of cereal grains. Satake measures the weight of a predetermined volume of cereal grains or measures the volume of a predetermined weight of cereal grains. These measurements are then used to correct the moisture content of the grains.

Thus, Satake measures moisture with an electrostatic sensor and uses that measurement to correct the moisture content of the grain using density and either measured weight or volume of the grain. In contrast to the position asserted in the Advisory Action, Satake does not use weight and volume of a quantity of cereal grains to calculate density which is then used to determine the moisture content in the cereal grains.

Therefore even if Rogers and Satake could be combined, there is still no reason or incentive to measure both weight and volume of a soil to determine density and eventually moisture content from those measurements. Moreover it is not clear how or why one skilled in the art would have modified the continuous process of Rogers with the batch process of Satake.

Joshi is directed to measuring the moisture content of grains, seeds, pulverized products, fruits and nuts, and industrial products. See column 5, lines 30-37. Joshi does not teach or suggest determining the moisture content of soil. As with Rogers, the products of Joshi would not have the same characteristics as the soil of the instant claims.

Joshi discloses the use of various instruments for determining the moisture, such as dielectric constant, resonant frequencies etc. The data (column 8, line 45) are measured values such a conductivity/permittivity. (See column 8, lines 62-64). Joshi utilizes nondestructive means such as a microwave instrument to determine moisture measurement.

Joshi does not rely on weight and/or volume and/or density to determine moisture. Joshi recognizes no relationship between weight, volume, and moisture, especially moisture of a growing substrate. Contrary to the position asserted in the Office Action, column 8, line 45 is not directed to using density to determine moisture content. This passage relates to using a probe and reflectometer to obtain data that may be used to determine moisture content. Such hindsight application of a single line taken out of context is not a proper basis for modifying Rogers to arrive at the instant claim.

Therefore even if Rogers and Joshi could be combined, there is still no reason or

incentive to measure weight and volume to determine density and eventually moisture. Moreover, as with Satake, it is not clear how one skilled in the art would have modified the continuous process of Rogers with the batch process of Joshi.

The claimed invention provides a simple and effective procedure for determining moisture based on easily measured variables without the use of electrostatic measurements or microwaves. Withdrawal of this rejection is requested.

Claims 2 and 3 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rogers in view of Satake and McNeff et al.

Claim 2, as amended, is directed to a method for preparing soil with a predetermined moisture content comprising:

-determining the volume of a quantity of soil,

-determining the weight of the quantity of soil,

-determining the specific density of the quantity of soil from the volume and weight;

-determining the moisture content of the quantity of growing substrate;

-calculating the additional amount of water necessary to obtain the predetermined moisture content of the quantity of soil, and

-adding water to the quantity of soil until the weight associated with the desired moisture content is obtained.

For the reasons discussed above, Rogers and Satake are not directed to measuring moisture content using volume and weight of a quantity of soil. Neither is directed to measuring moisture content of soil.

Moreover, Rogers describes a continuous flow and does not teach or suggest adding water until the weight associated with the desired moisture content is obtained. After passing through the counterbalance, Rogers does not keep track of the location of a volume of measured grain in order to add water to it to obtain a desired moisture level.

McNeff is directed to measuring moisture of grain whereby moisture is added to the grain, a sample of grain is removed and ground, and then moisture of the sample is measured using, for example, a capacitance-type sensor. McNeff is not directed to measuring moisture

content of a growing substrate or measuring moisture using volume and weight of a quantity of growing substrate.

Rogers, Satake, and McNeff rely on electronics to measure the moisture in a sample. None teaches or suggests measuring weight and volume to obtain the moisture content of growing substrate. Withdrawal of the instant rejection is requested.

Claims 4, 10-11, 17, 19 and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Satake in view of McNeff et al. Claim 4 has been amended to recite that the feed device comprises a conveyor belt.

Claim 4, as amended, is directed to an apparatus for determining the moisture content of soil comprising:

-a supply vessel placed on a weighing device to obtain a measured weight of the soil;

-a feed device for feeding predetermined volumes of soil to the supply vessel;

-a discharge device to release the soil from the supply vessel; and

-a computer for determining the moisture content from the predetermined volume and the measured weight;

wherein the feed device comprises a conveyor belt.

Satake determines moisture of cereal grains by *electrostatic* measurements using an electrostatic capacity sensor 18. This sensor is used to determine moisture of the grain. Although volume and weight may be measured in Satake, these values are not used for moisture determination. That is, Satake recognizes no relationship between weight, volume, and moisture, especially moisture of a growing substrate. Thus, Satake has no means (e.g. a computer) to determine the moisture content from the predetermined volume and the measured weight.

Moreover, claim 4 requires that the feed device comprises a conveyor belt. Satake does not teach or suggest a feed device comprising a conveyor belt as claimed. Instead, grain in Satake is allowed to free fall through a grain flowing passage (32) from a grain tank (30) of a grain drying apparatus.

McNeff is directed to measuring moisture of grain whereby moisture is added to the grain, a sample of grain is removed and ground, and then moisture of the sample is measured using, for example, a capacitance-type sensor. McNeff is not directed to measuring moisture content of soil or measuring moisture using volume and weight of a quantity of growing substrate.

McNeff further uses a sampling auger to transport grain to a mixing auger which then deposits the grain into a grinding mechanism or grinder. McNeff's apparatus does not utilize a conveyor belt to transport soil nor a supply vessel placed on a weighing device to obtain a measured weight of the soil; a feed device for feeding predetermined volumes of soil to the supply vessel; a discharge device to release the soil from the supply vessel; and a computer for determining the moisture content from the predetermined volume and the measured weight.

Satake and McNeff rely on electronics to measure the moisture in a sample. None teaches or suggests an apparatus to measure weight and volume to obtain a moisture content of growing substrate in accordance with claim 4. Moreover, neither teaches using a conveyor belt to supply soil to the supply vessel. Withdrawal of this rejection is requested.

Claims 5-7, 9 and 12-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Satake in view of McNeff et al. and further in view of Bajema et al.

These claims all require that the feed device comprises a measuring member for measuring the height of the soil carried along on the conveyor belt, and that the computer is adapted to determine from the measured height the quantity of soil carried along on the conveyor belt.

Satake and McNeff do not teach or suggest a conveyor belt in accordance with claim 4. Likewise neither teaches or suggests that the feed device comprises a measuring member for measuring the height of the soil carried along on the conveyor belt. Since height of soil is not measured in either Satake or McNeff, there is no reason to modify either Satake or McNeff to include a computer adapted to determine from the measured height the quantity of soil carried along on the conveyor belt. In particular, the primary reference Satake is directed to measuring samples of grain from a grain tank. One skilled in the art simply would not have modified the

apparatus of Satake to include a conveyor belt or means to measure height.

Bajema is directed a ground-crop harvester control system for potatoes and the like. Bajema utilizes electrical measurements to monitor the height of the product (e.g. potatoes.) See column 8, lines 16-18. This height measurement is not used to determine the moisture content of the potatoes. A separate means may be used to measure moisture level in soil. See column 8, line 19. No information is provided as to how such readings are achieved.

There is no suggestion of a weighing device to weigh a predetermined volume of material to determine the moisture content. Moreover, the conveyor operates in a continuous (not batch) mode.

It is not clear how or why the grain tank and free flow system of Satake would have been modified to measure the height of the material flowing through it based on Bajema. Satake does not utilize a conveyor belt feeding system and there is no reason one skilled in the art would have modified a grain tank to include such a system. The tank is used for drying the grain. Satake takes samples of the grain from the tank by a system attached to the tank.

There is no reason one skilled in the art would have modified Satake based on Bajema and arrive the apparatus of the instant claims. Withdrawal of the instant rejection is requested.

CONCLUSION

In view of the above amendments and remarks, withdrawal of the instant objections and rejections and issuance of a Notice of Allowance is requested.

Respectfully submitted,

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